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MARCH 4TH, 1862.

JOHN CRAWFURD, Esq., President, in the Chair.

Presents.—On the Unity of the Human Race, by Dr. Schvarcz Gyula (in Hungarian) ; and the Geology of Greece, by the same (presented by the Author).—The Athenæum, the Literary Gazette, the London Review, and the London Medical Review (by the Proprietors).

VIII.—*On the Shell-Mounds of Province Wellesley, in the Malay Peninsula.* By GEORGE WINDSER EARL, Esq., Member of the Royal Asiatic Society ; Corresponding Member of the Ethnological Society of London.

IN the month of April 1860, while ascending the Mudah river, which forms the northern boundary of Province Wellesley, I observed a large coasting boat loading with lime at a Chinese establishment on the British bank of the river, about seven miles from the mouth, and was informed by the native officials who accompanied me that the lime had been made from a large collection of shells, about a mile inland from the river, and which my informants believed to be a natural deposit. I was unable to ascertain further particulars at that time, being on my first tour of inspection to the frontier ; and it was not until the month of August following that I had occasion again to visit the neighbourhood. My object, this time, was to examine a canal or water-course between the Leher Ikan Mati Lagoons and the Mudah river, which had become a matter of dispute among the Malayan paddy-planters, whose land it drained ; one party charging the other with obstructing the course of the stream, and causing their lands to be flooded. While making my way to the spot along the narrow “binds” or ridges which divide the paddy-fields into small sections, I came unexpectedly on a dome-shaped mound of cockle-shells, eighteen feet high, and nearly two hundred paces in circumference at its base, lying about five furlongs to the north of the bridge that crosses the Leher Ikan Mati Lagoons.

There was a light growth of elephant-grass on the mound, that only concealed the shells on the spots where the tufts grew, leaving the interstices bare and exposed. After a long examination, I could detect no other than full-grown cockle-shells, from which the fish appeared to have been abstracted before they had been thrown on the heap ; for there could be no doubt whatever of the mound having been formed by human agency. Indeed, from the symmetry of its form, and the total absence of all appearance of antiquity, I should have been disposed to think that it had been

made within the last fifty years, had not the natives denied all knowledge of any tradition respecting its origin, and, at the same time, expressed their belief that it had been formed by nature.

From the summit of this mound there was a clear view over the country as far as the Mudah river, which presented an uninterrupted level except in a north-west direction, where there was a cluster of mounds apparently of larger size than the one I was on. These were distant rather more than a mile; and it was from one of these, I was informed, the Chinese lime-burners on the Mudah river obtained their shells. The morass that intervened was impassable, or I should have proceeded at once to inspect the interior of the one that had been opened, a gratification I did not enjoy until the 3rd of the following month, when I went overland to Bindahari on the Mudah river, and there embarked in a boat—this being the only route by which the lime-kilns were accessible. The kilns were two open furnaces close to the river-side, and near them was a heap of cockle-shells, that had been brought to them in carts drawn by buffalos. The shells were of the same kind as those I had seen on the surface of the mound at Leher Ikan Mati, but they were mostly in lumps or clusters, adhering together by the crystallization of the lime; the shells even which were detached, had evidently been broken off from the mass. The clusters could easily be broken by a blow with a heavy stick; but some adhered so closely, that the shell itself was broken by the blow, while the edges still adhered. The road ran in a direction nearly due south, over a level plain of loose sandy soil, about three feet higher than the usual level of high water at spring tides. The mound from which the shells were brought was visible over the top of the brushwood for some time before we reached it, the distance from the river-side being about a mile. The cutting had been made directly into its centre, and about one-third of its contents, amounting to nearly two thousand tons, at the rate of fifty cubic feet to the ton, had been already removed. The facilities for examination were therefore great: and I had also the advantage of being accompanied by an intelligent Chinese head-man, who had conducted the works from their commencement, about four years previous to my visit.

The road led into the very heart of the mound, the excavation forming a kind of centre, with nearly precipitous sides twenty-five feet high. The shells formed a compact mass by means of the crystallization already mentioned, but masses were easily broken out with the pick or crowbar. A long examination of the exposed surface did not enable me to detect any other shells than those of the edible cockle, although there was a difference of size in the shells grouped together in different parts of the mound, the largest shells generally occurring in the lower strata. It was not

until I came to examine the *débris* under foot that I could detect any extraneous matter whatever; but here my search was rewarded by finding a number of pieces of red rock or pigment, which had evidently been brought to their present shapes by human agency. The workmen assured me these had not been handled by them, except to be thrown aside as useless. I also found several water-worn quartz pebbles which must have been brought from a distance; together with a human pelvis, so brittle that it broke in two in my hand while examining it, and before I was thoroughly aware what substance it consisted of. This afforded me an opportunity of asking the Chinese head-man whether any human remains had been found in the course of their operations; and he replied, with some trepidation, that several skeletons had been dug up near the lower part of the mound, at the same spot in which the stones were found, but that he had treated these remains with great respect, having placed them in a large Martaban jar, and, as the Malays denied all connection with them, he had procured the services of a priest to perform religious ceremonies over their reinterment after the manner of the Chinese. He then pointed out the jar, which had been deposited at the back of the mound, near some water-holes, and I at once took possession of it, and, after pouring out the rain-water with which it was partly filled, dispatched it to the boat, together with the rocks and stones that I had picked up in the mound. These remains, together with specimens of the concrete and shells composing the mound, have been forwarded to England in a box addressed to Mr. William Napier, late of Singapore, and dispatched on the 22nd of November last by the ship *Ceylon* from Penang. I am of opinion that the human remains are of sufficiently marked character to enable physiologists to decide as to what race of people they may belong; indeed, it was the perusal of Professor Owen's paper "On the Osteology and Dentition of the Natives of the Andaman Islands" that led me to forward these remains to England, instead of depositing them in a local museum. I will merely add a few particulars, which may be useful as collateral evidence.

The name of the locality in which the mound is situated is Guah Gappah, a Malay term, the first meaning a cave or pit, and the other, Gappah, being the local name of a cockle, which is still abundant on the sea-shore. There are two other mounds within a few hundred yards of that I examined; one of larger size, although not higher, and apparently consisting of a cluster of several; the other appeared to be about the same size as the mound I saw at Permatang Ziga Ringit, and which was scarcely more than a third of the size of that examined on this occasion. The land for miles in every direction is low and uniformly level,

except in spots where depressions exist, these generally running inland at right-angles to the sea-shore. There are indications of the whole of this tract having been covered by the sea at a comparatively recent period, when the depressions, which are now being rapidly filled up by natural accumulations of vegetable *débris*, were probably arms of the sea. The mounds may therefore have been raised in the immediate vicinity of spots where living cockles may have existed in great abundance.

That these mounds have been raised by human agency cannot admit of a doubt; and it is almost equally certain that the fish had been removed from the shells before they were deposited, as it is rarely, if ever, that the two shells of the same bivalve are found in juxtaposition. This circumstance, coupled with the great extent of the deposit (the mounds at Guah Gappah alone containing about twenty thousand tons) lead to the inference that they were raised by a numerous people, for whom shell-fish formed an important article of food; at the same time, the crystallization of the shells at their points of contact throughout the mass, and up to the very summit of the mounds, affords conclusive evidence that a comparatively long period must have elapsed since the shells were deposited. The present inhabitants of the surrounding country are Malays (of whom there are upwards of forty-five thousand in the northern district of Province Wellesley), Samsams, a race allied both to the Malays and to the Siamese, and who probably formed the bulk of the population at the time Mahommedanism was first introduced, and lastly Semangs—a diminutive negro race—who now only exist as scattered tribes in the more inaccessible parts of the country, but who, from the names given by Malays to several places near the sea-board, appear to have been more widely distributed at a comparatively recent period. The Malays of the present day have no traditions as to the origin of the shell-mounds. They are, however, mentioned in the Marong Mahawangsa, the Malayan annals of the kingdom of Kedah or Quedah (to which Province Wellesley formerly belonged), but not in terms calculated to throw much light on the subject. These annals, or at least that portion of them which proved of historical interest, were translated by the late Colonel Low, when superintendent of Province Wellesley, and published in the third volume of Logan's *Journal of the Indian Archipelago*. The annalist makes repeated mention of the Hindu rajahs, who ruled previous to the introduction of Islamism, making collections of "lime and shells" for the purpose of building forts and palaces, which is commented on by Colonel Low, in the notes appended to the Annals, in terms so pertinent to the subject under review, that I will transcribe them here.

"We are here informed by our annalist that Raja Marong Pho

di Sat was laid or buried. Although, as I shall have occasion hereafter to shew, the people of Kedah were at this period worshippers both of Buddha and Siva, it must still appear that cremation was not practised. The word *simpan*, or to lay, is the word used by Malays when describing the burial of men of high rank. Within what were once the precincts of the Hindu temples, I have, indeed, found indubitable marks of the practice of burning the dead; but I apprehend that these were the ashes of priests and persons who had come from India to settle, or zealous native followers of the priests. I was fortunate enough to find, during one of my excursions near Gunung Jerrai,* several ruins of ancient tombs where bodies were interred; and from the size and materials of these tombs, of which the ruins were sufficient to enable me to form a judgment, I conclude they may be the mausoleums of some of the rajas named by our annalist, especially as the sites correspond very closely with those he describes, and were erected in the vicinity of temples now in ruin. These tombs had been built so close to Sivaic temples, that they must have been erected before the introduction of Islamism. The Malays who were along with me expressed their opinion, founded on certain anatomical appearances, that the occupants of these tombs were not of the Malayan race, but were most likely Klings.

"The rajas of Keda seem to have been given to locomotion. Almost every reign was followed by a change in the seat of government. This will help to account for the want of solidity in their forts. These, if we may judge from the existing ruins, were generally of mud; and where bricks and stone are used, these were built up without any other cement than a tenacious clay. The means of the first rajas, the earlier ones at least, were doubtless rather scanty; and all their superfluous money appears to have been lavished on religious edifices—which last, so far as I have been able to trace them, were of a simple form, and of moderate size, with hardly any sculpture to render them imposing. We have preparations for burning shells for lime frequently noticed; but I have not found any lime in any of the ruins that I have excavated, comprising all that were of any note. Coral-shells are the chief materials from which lime is now made in Keda and Pinang for architectural purposes, although limestone abounds at no great distance—mounds of shells were found by me near these sites—but probably it was found too expensive to use brick and mortar." (*Journal of the Indian Archipelago*, vol. iii, p. 256.)

The statement of the annalist respecting the origin of the shell-mounds must therefore have been an invention; and it may

* A mountain mass lying immediately inland from the present capital of Kedah, the summit being called Kedah Peak. The more inaccessible parts are inhabited by tribes of Semangs, or Oriental negroes. G. W. E.

possibly have prevented Colonel Low, who was a zealous archæologist, from more closely examining the mounds when the opportunity occurred. But, at least, it is conclusive that the countrymen of the annalist had no knowledge of their origin, which must be referred to a more ancient people. The annalist mentions four tribes or races as co-existing in the country previous to the introduction of Islamism—the Girgassi, the Semang, the Bila, and the Sakai; the three last exist under the same name at the present day. Each of these may have furnished its quota of disciples to the Hindu priests and teachers; indeed, the term Bila is now applied to those Semangs who have adopted somewhat settled habits, and may formerly have indicated the converts of that race to Hinduism. The Sakai are a small tribe of long-haired people inhabiting the interior of Perah, and they appear to differ from the other inhabitants only in being more unsettled in their habits, and in having been as yet unconverted to Islamism. The Girgassi are described in the Annals as a comparatively fair people, who formed the bulk of the population under the Hindu rajahs, and with whom the Malays afterwards intermarried; but, as the name is no longer known, they have probably merged into the present population. Of these, I think that the Semangs are most likely to have been the constructors of the mounds, as shell-fish must have been a most important article of food before they were forced inland from the coast. It has also been recently ascertained that the Andaman Islanders, who are almost identical with the Semangs in personal characteristics, are in the habit of forming mounds of sea-shells at the present time, as one was found on Viper Island only a few months ago, and has been levelled by the Public Works Department, the material being used in making roads. I have been unable to ascertain further particulars. Under any circumstance, the remains I have sent home in the *Ceylon* will afford the best test upon this point, and I shall look forward with great interest to the result.

Province Wellesley, December 9th, 1861.

Mr. EVANS wished Mr. Lubbock had been present, as he had visited the Danish kjøkkenmøddings last year with Professor Busk, and might have drawn some comparison between these curious refuse-heaps and the shell-mounds described in Mr. Earl's paper. From the fragments of red rock met with, and other circumstances, he did not think these mounds had been raised as sepulchres for the human remains that occurred in them, or, if burials had taken place, that they were of later date than the shell-deposit; for it was not likely that in a site occupied by families of living individuals the latter should bury their dead amongst the refuse of their houses. The mounds of Denmark were best known in this country from the admirable description in the October number of the *Natural History Review*; but these "kitchen-moddings", which were the accumulations of the refuse thrown out from the habitations of the early Danish inhabitants of the Stone Period, con-

tained not only cockle, mussel, and oyster shells, but also those of nassa and whelk, commingled with which were fragments and pieces of bones, the latter having often been broken to get at the marrow. With this refuse, stone and flint implements, flint flakes, and rude axes were found; but these latter differed from the fossil flint implements of the Drift Period in their form and character. Professor Worsaae divides the Danish Stone Period into two ages; and it was a curious fact in respect to these kjökkenmöddings, that, with the bones, those of the caperkailzie, which feeds on pine-shoots, were often met with, so that it was to the "Pine Forest Period" of that country that the kjökkenmöddings were to be most probably assigned. The date afforded by the accumulations of peat-beds in Denmark, composed successively of pine, oak, and beech, was sufficient to prove the vast antiquity of the Danish early Stone Period.

Mr. ST. JOHN said that, as the native houses were built on posts which varied in height from eight to forty feet, it was not difficult to account for those shell-heaps rising to the height stated by Mr. Earl, as the natives would not be tossing up the shells, but rather throwing them down from their lofty verandahs.

Mr. MACKIE said it would be very interesting to know whether the human remains found in these Malayan shell-mounds belonged to a large or a small race; and whether such race to which they belonged was still existing in the district. He thought the evidence of the oldest human relics as yet met with, tended towards the idea that the primitive men possessed distinctive osteological characters, and that they had wide geographical ranges. He thought—unless these should prove to be of one of the ordinary Malay races—a comparison of them should be made with European and American relics of seemingly the same age. Upon the supposition of the unity of origin of the human race, we should look for greater identity of character in the primitive races, however far apart they might be in geographical distribution.

Mr. LUKE BURKE said that the refuse-heaps, with which these shell-mounds had been compared, were mere rude masses thrown confusedly together, and formed of things tossed out of the way in the easiest manner possible. Here, on the contrary, we had regular mounds, and, what was more singular, interments connected with them. Nor did it at all follow that, because these mounds occurred on the borders of a sea or lake, we were justified in inferring that they had no other object than that of enabling the people to put the refuse of their meals out of their way. He remarked that there were some curious points of analogy between these shell-mounds and the earth mounds of other regions, such, for instance, as those of the Mississippi Valley; and it was therefore a question whether these province Wellesley mounds had not been raised for burial purposes, or whether they might not even have had a religious value. Our actually finding them used as burial-places, did not by any means prove them to have been originally meant for such; since we bury in our churches, though we never build churches for sepulchral purposes. In like manner, the mere fact of finding great pyramids, gigantic mounds, cromlechs, and the like representations of vast primæval labours, containing the remains of the dead, was no evidence whatever that the original destination of these monuments was sepulchral. On the contrary, such marks are quite out of proportion with sepulchral expenditure in known times; nor is it to be imagined that any people will lavish on the tombs of their kings or chiefs labour and resources equal to, or even more vast than, any which they expend on the temples, altars, or shrines of their gods, or on works of national defence or utility.

Dr. HUNT said that in the Gulf of Mexico there was a large number of

beds of gnathon shells, which had doubtless resulted from the refuse shells thrown into heaps by the aboriginal population. There was no doubt of their human origin, as marks of fire, remains of feasts, and human bones had been found with them. The antiquity of the shell-mounds of the Malay peninsula might perhaps be estimated by the distance from the shell-mounds at which the living species now exist. It is most likely those shells had been accumulated by human agency, very near to the position in which they were found in a natural state. Rude people had not the means of taking large quantities of food far into the interior of their country. Fish from the coast was sometimes carried up rivers into the interior by canoes; but, when these did not exist, the natives came to the coast when they required the food found there. He thought that geology was destined to throw much light on the antiquity of these mounds, by assigning the probable rate per century at which the sea had receded from given points. Such shell-mounds were found all over the world, from the Shetland Islands to Australia: but he believed there had been none found so far in the interior of a country as those found some fifty miles above the town of Mobile. The mounds are there found covered by one or two feet of mould, with trees growing on them. He thought the contents of these mounds could alone decide their object, and the manner in which they were formed.

Dr. HODGKIN thought the paper contained a variety of interesting matter. Collections of shells might be perfectly natural. On the shores of the Frith of Forth we may at some seasons find the shells of the *Solen siliqua* strewn in great profusion; and in Suffolk there are immense beds of shells, which are brought to town and distributed over the footpaths in our parks. Mounds such as have now been described might therefore be the work of nature, and not of man. In some cases, it is clear the molluscs had been collected for food. The implements belonging to a shell-fish eating people would probably be low in art, for such a diet was a mark of their lowness of civilization, and the conclusion drawn from it would generally be correct; but our own experience, in the case of oysters, shows that it is not always reliably so, as they are eaten in large quantities by the most civilized, and have always been a favourite food. Nor must we carry the associated deduction too far in respect to the stone implements. We do not use our best instruments for opening oysters; and ancient races, possessed of better knives, might still use their commoner flint implements, or might even extemporize them for such rough purposes, as boys use stones to get at the kernels of stoned fruit. If the mounds were merely the refuse shells after their contents were eaten, it is difficult to conceive why they were thrown together into mounds, the size of which would excite surprise, if we did not see the same thing done elsewhere. Monte Testaceo, near Rome, is an example of an enormous collection of broken pottery. There was a foolish tradition that the fragments are the remains of the vessels in which foreign poison had been brought for the Roman ladies to poison their husbands. There can be little doubt that the mound is merely the gradual accumulation of spoilt vessels, though it forms a hill almost entirely excavated for extensive cellars containing excellent wine. Near the Jaffa gate of Jerusalem there are two very considerable mounds consisting entirely of ashes, thought to be those cast out from the temple after the daily sacrifices. But why were they accumulated in one place? As the Malayan shell-mounds are now used for lime, so these ash-heaps may at some future time be put to use to supply phosphate of lime for manure. At Alexandria, Cairo, Lydia, and Heliopolis, we see examples of large mounds containing abundance of broken fragments. Thus refuse matter is commonly thrown up into mounds, and there is nothing surprising in such mounds being subsequently used for sepulture; but it is not likely that they would be used for

that purpose by those who made them. When he was in Jerusalem, he was shewn by the Consul, M. Fynn, a portion of a great mass of shells brought from a part of the coast where the dyeing of purple was practised, in which the murex was employed; but, on examination, the shells of this mass did not prove to be of the identical species. The shells in this heap were, it may be observed, cemented together into a solid breccia by water containing carbonate of lime in solution. All such facts are interesting, but we must not press them too far. If these heaps be not carted away for lime, they would prove to be amongst the most lasting monuments for the archæologist. From the greater or less proportion of animal matter remaining in these collections, we cannot judge of their age; for bones placed in a porous bed, through which water could freely pass, would have their gelatinous portion washed out in a few years, by a process somewhat like that recommended by the celebrated director of the French Mint, M. D'Arcet, for the extraction of gelatine for culinary purposes. He had recently read in a French journal an account of the examination of the chemical composition of some bones 1100 years in age, from which the author attempted to make out rules for the determination of the age of such relics, dependent on the quantity of gelatine remaining in them in proportion to the phosphate of lime. Any such conclusions must be liable to great inaccuracy, from the very various influences of this kind to which the specimens had been exposed. Some years ago, a party of geologists had placed before them a jelly made with gelatine extracted from bones from the Kirkdale cavern, or from a similar source, of far greater antiquity than those examined by the French chemist, who suggested this mode of ascertaining their date.

Mr. EVANS said that the mounds in Denmark were not so symmetrical, but run together as if the huts had been built in a circle, and, in some cases, as if there had been a hut in the middle, and the refuse had been thrown up as a defence. The materials were only slightly coherent, and presented a regular slope like shot-piles. In the course of ages, the winds and weather might have taken off the angles and irregularities, and thus their symmetrical shapes might not be so much a matter of design as of circumstances. Again, the ground-area of the heap might have been restricted, and therefore such mounds might attain their great elevation by the space over which the refuse had to be shot being limited. Another point in the antiquity of the *kjökkenmøddings* was, that no implements of any kind, except those of rude manufacture, were found. Had the polished implements been in use at the time when these heaps were being accumulated, there was every probability that some trace of them would have been to be found in the heaps. None, however, had yet been found; and, though the evidence was of a purely negative character, it carried great weight with it, and afforded a strong presumption that these refuse-heaps were of earlier date than the ground cells of the so-called "Stone Period".

Mr. SPENCER ST. JOHN, when passing shortly since through Province Wellesley, had had these relics shewn to him by Mr. Earl. There was no doubt these portions of skeletons were very ancient. There were no entire skulls; all the fragments that had been found were portions of the top of the crania. He concurred with Mr. Evans that the burials had taken place after the deposit of the shells. Great mounds of shells were thrown up by the pearl-fishers in the vicinities of the town of Brunei, which at one time might almost have vied in size with those of Province Wellesley. He had seen cockle-heaps on the banks of rivers in districts thirty miles from the coast, but within the influence of the tides.

Mr. WHITE said that he had often observed the shell-banks on some parts of the sea-shore of Province Wellesley, and that they consisted almost

entirely of one kind of shell. These shells were used for making lime for building purposes, and occasionally for manure. The physical character of the province, in its general aspect, was that of an extensive alluvial plain, spread out between the central mountains (the backbone of the Malay peninsula) and the sea-shore, and formed by the deposit from the numerous rivers flowing from these mountains. This plain was intersected by ridges of sand, generally parallel with the sea-shore, and which must at one time have formed a portion of the shore; and it is on some of these ridges that the shell-mounds exist, as described in Mr. Earl's paper. These sand-reefs were now used by the Malays as sites for their villages. Portions of them, or isolated reefs, were set apart as places of burial; and the low-lying spaces intervening between them were under rice cultivation. His impression was, that the shell-mounds were originally a natural formation by the growth and decay of animal life, and had probably been increased to some extent by the action of the tides; and that the Samangs or aborigines (precursors of the Malays in the occupation of the Malay peninsula) having fixed their residences upon or near them, had, at a few places, raised them to their present height by heaping up the refuse shells of their food. On the coast of British Guiana there were occasionally extensive banks of shells, which were brought and carried away by the tides. These shells had been found of great value to the sugar factories, as manure for the land; and he had frequently met with them at considerable distances from the sea-shore, in strata intermixed with sand varying from a few inches to several feet in depth. The shells which he had seen in Province Wellesley were almost entirely of a kind of mussel. Living shells of the same kind were still found there, but in very small quantities, and were used as food by the Malays. The diminution in their numbers was perhaps owing to the increasing freshness of the sea-water, in the narrowing space between the shore of Province Wellesley and the opposite island of Penang.

Mr. MILLIGAN remarked that shell-mounds were of two sorts. Shell-beaches, which fell under the domain of the geologist; and shell-mounds proper, formed by aboriginal inhabitants. Shell-beaches were usually not far from the shore. In Tasmania and the adjacent islands, the elevation of the land had left a succession of terraces; one about fifteen to sixteen feet above present high-water mark yields thick beds of shells, now quarried out and burned for lime, chiefly of a *pectunculus* still extant in the sea below. On the soft sunny sides of river-banks, and by the grassy margins of springs of water near the sea, heaps of shells occurred under conditions which stamped them as the feeding places of the aborigines. A main feature of difference between shell-mounds proper and shell-beaches was, that in the former the shells had all undergone the process of roasting, and he had accordingly observed that they had gone fast to decay. When the refuse-mounds consisted of oysters, mussels, cockles, and other bivalves, flint-knives were usually found in them. On the other hand, where the food had been derived from univalves, round stones of different sizes were met with—one, the larger, on which they broke the shells, the other and smaller having formed the hammer with which they broke them. The aborigines had assured him that these stones and flint implements would always be met with in such mounds; and, upon examination, he had found it so. Bones would also probably be found in artificial shell-mounds; as it was not reasonable to suppose that aborigines would live on shell-fish alone, in a country where kangaroo, wallaby, opossums, wombats, and other animals are abundant. Accordingly their custom was to sojourn chiefly in the interior, and only occasionally, by way of variety, to visit the sea-coast, whence they would make hunting excursions inland, carrying back to the scene of their feasts on the sea-shore the produce of the chase; thus, of

course, mingling bones with the exuviae of the shell-fish on which they fed. The character of the instruments they used would doubtless be good evidence of their position in the scale of civilization.

MR. NAPIER said that he had not formed any decided opinion as to the origin of these mounds. They might have been originally raised as sepulchral monuments, but the nature of the materials seemed to militate against the idea of their being *subsequently* used for that purpose. With respect to the view expressed by Mr. St. John, that the mounds were formed by the shells of the cockle, consumed by former native inhabitants, being thrown from their houses as eaten, he would observe, that Mr. Earl described the excavated mound entered by him as twenty-five feet high, with a diameter of sixty yards, or a hundred and eighty feet, dimensions which seemed opposed to such an origin; and, in adopting that view, Mr. St. John had probably in mind the houses of the Borneo Dyaks, with which he was so familiar, and which were sometimes raised on posts forty feet high; whereas it was not known that any natives of the coasts of the Malayan peninsula had raised their houses on posts over ten or twelve feet in height. He differed, also, from Mr. White, in regarding these mounds as in part casually, and in part sea-formed. If the sea were an agent in their formation, the soil surrounding the mounds would bear ample evidence of that circumstance, and the mounds themselves would contain quantities of sand and silt mixed up with the shells; which Mr. Earl seems to negative the existence of, in describing the mound as formed of a crystallized mass of the cockle-shell, which was broken into by the picks. On the whole, he was inclined to regard the mounds as of designed formation, though the admixture of human bones might be accidental.

MR. CULL. Mr. Johnson has mentioned the possibility of these shell-mounds being the work of the Ichthyophagi of the Indian annals. I wish to ask about these annals. In what language are these said annals written? Will Mr. Johnson give his authority that a tribe is spoken of designated as fish-eaters in Indian annals? Will he give his authority for the existence of Indian annals?

MR. JOHNSON said it was long since he had read the work referred to; but the statement he had made was upon its authority, not his own researches.

THE PRESIDENT said that he had some recollection of papers in the early volumes of the *Asiatic Researches*, by Lieutenant, afterwards Lieut-Colonel Welford. The Colonel was a man of much learning, but a confused and inconsequential writer, and no one could well say what conclusions he came to. He was not now considered, that he was aware, an authority on any Oriental question. Mr. Johnson has a better opinion of Col. Welford than he had. The ship *Ceylon* was on her way to this country with the relics, and would no doubt arrive in the course of a month. There would then be an opportunity of examining them carefully. As to whether they were of a small race or not, there were at present only two races on the peninsula—the Sámangs, some four feet eight inches in height, and the Malays, six inches taller. If the bones were in good preservation, it would be easy to tell at once to which of these they belonged. For his own part, he thought the mounds were of the nature of the *kjökkenmöddings*, or refuse shell-heaps of Denmark. He believed with Mr. St. John, that the piles of the Swiss lake houses might be fifteen or twenty, and, if in deep water, even as much as forty feet long. He had never seen them less than ten feet. The shell-mounds referred to in the paper should be far more minutely examined.